

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Timothy C. Krywaczyk, et al. **Examiner:** Steven H. Rao
Serial No.: 10/715,689 **Art Unit:** 2814
Filed: November 18, 2003 **Docket:** END920030002US1 (18560)
For: ULTRAVIOLET ENERGY **Dated:** October 10, 2006
CURABLE TAPE AND METHOD
OF MAKING A SEMICONDUCTOR
CHIP USING TAPE

Confirmation No.: 4803

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 2233-1450

RESPONSE TO NOTICE OF NON-COMPLIANT APPEAL BRIEF

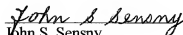
Sir:

In a Notice dated September 8, 2006, the U.S. Patent and Trademark Office indicated that Appellants' Brief filed August 18, 2006, was non-compliant because it does not contain a statement of the status of all claims, and in particular, the Brief did not mention the status of Claims 10, 13, 15 and 20-29.

CERTIFICATE OF ELECTRONIC FILING

I hereby certify that this correspondence is being deposited with the United States Patent & Trademark Office via Electronic Filing through the United States Patent and Trademark Office e-business website, on October 10, 2006.

Dated: October 10, 2006


John S. Sensny

Appellants are submitting herewith an Amended Brief. This Amended Brief is identical to the original Brief except that in the Amended Brief, the status of Claims 10, 13, 15, and 20-29 are identified. None of those claims is involved in this Appeal.

It is believed that this Amended Brief is fully responsive to the Notice of September 8, 2006, and entry of the Amended Brief is respectfully requested.

This submission obviates the non-complaint Appeal Brief Notification.

If the Examiner believes that a telephone conference with Appellants' Attorneys would be advantageous to the disposition of this case, the Examiner is asked to telephone the undersigned.

Respectfully submitted,

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Enclosures: Amended Appeal Brief including Appendix A

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Hon. Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

AMENDED APPEAL BRIEF

Sir:

Pursuant to 35 U.S.C. 134 and 37 C.F.R. 41.37, and in response to a Notification dated September 8, 2006, of Non-Compliant Appeal Brief, entry of this Amended Appeal Brief in support of the Notice of Appeal filed June 8, 2006 in the above-identified matter is respectfully requested.

CERTIFICATE OF ELECTRONIC FILING

I hereby certify that this correspondence is being deposited with the United States Patent & Trademark Office via Electronic Filing through the United States Patent and Trademark Office e-business website, on October 10, 2006.

Dated: October 10, 2006

John S. Sensay

I. Statement of Real Party in Interest

The real party in interest in the above-identified patent application is the International Business Machines Corporation.

II. Statement of Related Proceedings

There are no other prior or pending appeals, interferences or judicial proceedings known to appellants, the appellants' legal representative, or assignee which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. Statement of Claim Status and Appealed Claims

A. Claim Status

Claim 1 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 2 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 3 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 4 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 5 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 6 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 7 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 8 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 9 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 10 has been cancelled.

Claim 11 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 12 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 13 has been cancelled.

Claim 14 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 15 has been cancelled.

Claim 16 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 17 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 18 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 19 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 20 has been cancelled.

Claim 21 has been cancelled.

Claim 22 has been cancelled.

Claim 23 has been cancelled.

Claim 24 has been cancelled.

Claim 25 has been cancelled.

Claim 26 has been cancelled.

Claim 27 has been cancelled.

Claim 28 has been cancelled.

Claim 29 has been cancelled.

Claim 30 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 31 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 32 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 33 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 34 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

Claim 35 stands rejected based on 35 U.S.C. 102 as being fully anticipated by PCT patent application no. 92/15651 (Moon).

B. Appealed Claims

Claims 1-9, 11, 12, 14, 16-19 and 30-35 are appealed. A clean copy of these claims is contained in Appendix A to this Appeal Brief.

IV. Statement of Amendment Status

Applicants are submitting herewith an Amendment, under 35 U.S.C. 116, to correct an informality in Claim 34. As of the time of the filing of this Appeal Brief, this Amendment has not been entered.

V. Summary of Claimed Subject Matter

Concise explanation of the subject matter of claim 1

Claim 1 is drawn to a UV energy curable tape (Page 5, lines 2-5; Page 6, lines 4-7) comprising a support layer (Page 5, line 2; Page 7, lines 1 and 2), and an adhesive material (Page 5, lines 2 and 3; Page 6, line 5; Page 7, lines 3-8) positioned on the support layer. This adhesive material includes a UV energy curable oligomer (Page 5, line 3; Page 5, line 5; Page 7, lines 4-8), a UV energy initiator (Page 5, lines 3 and 4; Page 6, lines 5 and 6; Page 7, line 21 to Page 9, line 7), and a material (Page 5, lines 4 and 5; Page 6, lines 6 and 7; Page 9, line 8 to Page 10, line 18) which starts to emit optical light of a first type when the tape becomes substantially fully cured.

Concise explanation of the subject matter of Claim 11

Claim 11 is also directed to a UV energy curable tape (Page 5, line 7; Page 6, line 21 to Page 7, line 2) comprising a support layer (Page 5, line 7; Page 6, line 22 to Page 7, line 2) and an adhesive material (Page 5, lines 9 and 10; Page 6, lines 23-26; Page 7, lines 3-8) on the support layer. As described in Claim 11, the support layer includes a material (Page 5, lines 8 and 9; Page 6, lines 22 and 23; Page 9, line 23 to Page 10, line 18) which starts to emit optical light of a first type when the tape becomes substantially fully cured. Also, the adhesive material, as described in Claim 11 is positioned on the support layer and has a UV energy

curable oligomer (Page 5, line 10; Page 6, lines 24 and 25; Page 7, lines 4-8) and a UV energy initiator (Page 5, lines 10 and 11; Page 6, lines 25 and 26; Page 7, line 21 to Page 9, line 7) as part thereof.

Concise explanation of the subject matter of Claim 34

Claim 34, like Claim 1, is drawn to a UV energy curable tape (Page 5, lines 2-5; Page 6, lines 4-7) comprising a support layer (Page 5, line 2; Page 7, lines 1 and 2), and an adhesive material (Page 5, line 3; Page 6, line 5; Page 7, lines 4-8) positioned on said support layer. As described in Claim 34, the support layer includes a UV energy curable oligomer (Page 5, line 3; Page 6, line 5; Page 7, lines 4-8), a UV energy initiator (Page 5, lines 3 and 4; Page 6, lines 5 and 6; Page 7, line 21 to Page 9, line 7), and a given material (Page 5, lines 4 and 5; Page 6, lines 6 and 7; Page 9, line 8 to Page 10, line 18) for emitting light. Claim 34 includes the additional limitations that a defined amount of UV energy is needed to substantially fully cure the tape (Page 10, lines 8-11); and that same defined amount of UV energy causes the given material to begin to emit light (Page 9, line 22 to Page 10, line 3) of a given type, whereby the given material provides a visible indication that the tape is substantially fully cured (Page 10, lines 5-8).

VI. Grounds of Rejection to be Reviewed On Appeal

Appellants ask that the following grounds be reviewed:

Whether Claims 1-9, 11, 12, 14, 16-19 and 30-35 are fully anticipated, under 35 USC §102, by Moon.

VII. Argument

A. Rejection of Claims 1-9 and 30-33

The rejection of these claims is improper because Moon does not disclose a tape including a material which starts to emit optical light of a first type when the tape becomes substantially fully cured. Claim 1 is representative of Claims 1-9 and 30-33.

A. This Invention

The present invention provides a UV curable tape that includes a material that starts to emit light, or light of a different color, when the tape become substantially fully cured. This feature is very useful because it makes it easy to ensure that, when the tape is used, it is at least substantially fully cured before being removed. In particular, this is achieved by simply waiting until the appropriate light or color change occurs, indicating that the tape is substantially fully cured, before removing the tape.

Waiting to remove the tape until it is substantially fully cured is, in turn, helpful because this reduces, or substantially eliminates, the amount of tape residue left behind when the tape is removed.

In the specific example discussed in the specification, when the tape is used with a semiconductor wafer, the tape can be removed without leaving any significant residue.

This reduces the cost of the semiconductor fabrication process, and reduces the length of time needed for that process.

B. The Prior Art

Moon, the only reference relied on by the Examiner to reject the claims, discloses a process in which light is used to polymerize a material. This material may include fillers, tackifiers, dyes, pigments and viscosity adjusting agents. More specifically, the Moon procedure is used to polymerize a monomeric mixture of partially prepolymerized syrup. A two-step process is used to polymerize the material.

With one embodiment, in the first step, the monomeric mixture or syrup is irradiated with electromagnetic radiation of from 280 to 500 nanometer wavelength and from .01 to 20 mW/cm² average light intensity to effect conversion of the monomeric mixture or syrup to an acrylic copolymer. After this, in the second step, the acrylic copolymer is irradiated with electromagnetic radiation of from 280 to 500 nm wavelength and having an average light intensity of greater than 20 mW/cm² to at least substantially complete the photopolymerization reaction of the acrylic copolymer.

C. Differences between Claim 1 and Moon

As mentioned above, Moon does not teach the principle of providing the tape with any light emitting material that starts to emit light when the tape become substantially fully cured, as described in independent Claim 1.

After carefully studying the prosecution history of this application, it appears that there are two main issues: (1) should the Examiner take into consideration the feature that the tape includes material which starts to emit light of a first type when the tape becomes substantially cured; and (2) if so, does Moon disclose this feature (Office Action of March 8, 2006, page 3, lines 4-7).

The Examiner argues that this feature should not be taken into account because it is a product-by-process limitation, and, even if it is considered, Moon discloses this feature.

Appellants respectfully disagree with both of the Examiner's contentions.

With regard to the first of these issues, it is important to note that Appellants are not claiming a cured tape, but instead are claiming a curable tape. Moreover, Appellants are not claiming any process for forming a tape, curable or cured. Instead, Appellants are claiming a curable tape that is provided with a feature that functions in a specified manner – material which starts to emit optical light of a first type – under specified conditions - when the tape becomes substantially cured. This claim limitation is no more of a product-by-process limitation than any other claim limitation that describes a specific feature that functions in a specified manner under specified conditions.

Claim 1 sets forth specific structural elements and describes how those elements function together to achieve the desired result. In particular, Claim 1, which is directed to a UV energy curable tape, describes, among other features, a support layer, a UV energy curable oligomer, and a material that starts to emit optical light of a first type when the tape becomes substantially fully cured.

These are positive, structural features, not product-by-process limitations, and these features of Claim 1 describe how the elements of the invention work and how the inventive results are achieved. Thus, the feature that the material starts to emit light of a first type when the tape becomes substantially fully cured, should be taken into account when determining the patentability of the claims.

In the final rejection, the Examiner argues that "In order to be given patentable weight, a functional recitation must be expressed as a 'means' for performing the specified function, as set forth in 35 USC Section 112, 6th paragraph (Office Action of March 8, 2006, page 3, lines 11-13).

Appellants respectfully disagree. 35 USC 112, 6th paragraph allows a claim element to be described as a means plus function, but does not require that a functional recitation be described in this way.

Furthermore, it is the above-discussed feature that distinguishes claim 1 from Moon.

What is missing from Moon is the matching of the light emitting material with the degree of curing of the tape.

Moon simply does not teach the principle of providing the tape with any light emitting material designed to start emitting light when the tape becomes substantially fully cured.

On this issue, the Examiner cites Moon, page 7, lines 18-21, which disclose that the tape may be provided with several materials including a dye. The present invention is much more than simply providing the tape with, for example, a dye. Instead, what is important is that the light emitting material is designed so that it functions in a particular way under specific conditions – that is, the material starts to emit light of a first type when the tape becomes substantially cured. The use of any dye for this purpose under these conditions is not disclosed in or suggested by Moon.

Also, on this point, the Examiner cites a portion of the present application and argues that Moon's description of UV dyes/pigments used for the same purpose under similar circumstances will produce the present invention.

Applicants respectfully submit, though, that Moon does not disclose the use of a dye for the same function for which they are used in the present invention – to provide a visual indication that the tape has become substantially fully cured. This teaching is simply absent from Moon.

Significantly, the Court of Appeals for the Federal Circuit emphasizes that a strict identity test must be met in order for a reference to anticipate a claim under 35 U.S.C. 102. For instance, in Apple Computer, Inc. v. Articulate Systems, Inc., 57 USPQ2d 1057, 1061 (Fed. Cir 2000), the Court explained that: "Anticipation under 35 U.S.C. 102 requires the disclosure in a single piece of prior art of each and every limitation of a claimed invention." "Substantial identity" or "equivalency" is not sufficient. RCA Corp. V. Applied Digital Data Sys., Inc., 221 USPQ 385 (Fed. Cir. 1984).

Because of the above-discussed difference between Claim 1 and Moon, it cannot be said that Moon anticipated Claim 1 under 35 U.S.C. 102. Claims 2-9 and 30-33 are dependent from Claim 1 and distinguish therewith over Moon. Accordingly, the Board of Appeal is respectfully requested to reverse the rejection of Claims 1-9 and 30-33 under 35 U.S.C. 102.

B. Rejection of Claims 11, 12, 14 and 16-19

The rejection of these claims is improper because Moon does not disclose a UV energy curable tape comprising a support layer including a material which starts to emit optical light of a first type when the tape become substantially fully cured. Claim 11 is representative of Claims 12, 14 and 16-19.

Claim 11 is similar to claim 1, and in particular, describes a UV energy curable tape including a material which starts to emit optical light of a first type when that material becomes substantially fully cured. Accordingly, for reasons analogous to those advanced above in connection with Claim 1, Claim 11 also distinguishes over Moon.

Claim 11 includes the additional limitation that this light emitting material is part of the support layer. In rejecting Claim 11 in the Final Rejection, the Examiner cites Moon, Page 7, lines 18 to 21 as disclosing a support layer having a material which starts to emit optical light when said tape is substantially fully cured (Office Action of March 8, 2006, paragraph bridging pages 4 and 5). This portion of Moon indicates that various materials can be blended with the polymerizable monomer mixture. This portion of Moon, though, does not disclose that any light emitting materials can be included as part of the support layer.

This feature of this embodiment of the invention is of utility because it allows the use of light emitting material that may be incompatible with the adhesive.

Because of the above-discussed differences between Claim 11 and Moon, Claim 11 is distinguished from Moon. Likewise, Claims 12, 14 and 16-19, which are dependent from Claim 11, also are distinguished from Moon. The Board of Appeals is respectfully requested to reverse the rejection of Claims 11, 12, 14 and 16-19 under 35 U.S.C. 102.

C. Rejection of Claims 34 and 35

The rejection of these claims is improper because Moon does not disclose a UV energy curable tape comprising an adhesive material including a given material for emitting light and that begins to emit light under the conditions specified in Claim 34. Claim 34 is representative of Claim 35.

Claim 34, like Claim 1, describes a UV energy curable tape comprising a support layer and an adhesive material positioned on the support layer and including a given material for emitting light. Claim 34 describes the additional feature that a defined amount of UV energy is needed to substantially fully cure the tape, and that this same defined amount of UV energy causes the given material to begin to emit light of a given type, whereby said given material provides a visible indication that the tape is substantially fully cured.

Because of the similarities between Claim 34 and Claims 1, Claim 34 distinguishes over Moon for reasons analogous to those advanced above in connection with Claim 1. Furthermore, Moon does not disclose any use of the light emitting materials for the purpose of providing a visible indication that the tape is substantially fully cured. Accordingly, Moon does not teach the principle of providing the tape with a light emitting material that begins to emit light of a given type under the conditions specified in Claim 11. Specifically, Moon does not disclose that a defined amount of UV energy - which is the same amount of UV energy needed to substantially fully cure the tape - also causes the light emitting material to begin to emit light of the given type.

This feature further distinguishes Claim 34, and Claim 35, which is dependent from Claim 34, from Moon. The Board of Appeals is, thus, also asked to reverse the rejection of Claims 34 and 35 under 35 U.S.C. 102.

IX. Conclusion

In view of the above-discussed differences between Claims 1, 11 and 34 and Moon, these claims distinguish over Moon, Claims 2-9 and 30-33 are dependent from Claim 1 and distinguish therewith over Moon. Similarly, Claims 12, 14 and 16-19 are dependent from, and distinguish over Moon with, Claim 11; and Claim 35 is dependent from Claim 34 and distinguishes therewith over Moon. Thus, the rejection of the claims 1-9, 11, 12, 14, 16-19 and 30-35 under 35 U.S.C. 102 is not proper, and the Board is requested to reverse this rejection.

X. Claims Appendix

A clean copy of Claims 1-9, 11, 12, 14, 16-19 and 30-35 is contained in Appendix A to this Appeal Brief.

XI. Evidence Appendix

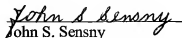
Appellants are not relying on any affidavits, extrinsic documents or extrinsic evidence.

XII. Related Proceedings Appendix

As indicated above, there are no other prior or pending appeals, interferences or judicial proceedings known to appellants, the appellants' legal representative, or assignee which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

Respectfully submitted,

Dated: October 10, 2006


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Enclosure: Appendix A

APPENDIX A

1. A UV energy curable tape comprising:
a support layer;
an adhesive material positioned on said support layer, and including a UV energy curable oligomer, a UV energy initiator, and a material which starts to emit optical light of a first type when said tape is becomes substantially fully cured.
2. The UV energy curable tape of claim 1, wherein said adhesive material comprises an acrylate oligomer.
3. The UV energy curable tape of claim 1, wherein said UV energy curable oligomer comprises a material capable of reacting with radicals to form longer chain polymers.
4. The UV energy curable tape of claim 1, wherein said UV energy initiator comprises a photoinitiator.
5. The UV energy curable tape of claim 4, wherein said photoinitiator includes diphenyl groups that create radicals when exposed to UV energy.

6. The UV energy curable tape of claim 1, wherein said material which emits optical light comprises UV sensitive ink.
7. The UV energy curable tape of claim 6, wherein said material which emits optical light comprises from about .001 weight percent to about 20 weight percent of said tape.
8. The UV energy curable tape of claim 1, wherein said material which emits optical light comprises UV sensitive dye
9. The UV energy curable tape of claim 1, wherein substantially fully cured comprises the absorption of about 5 millijoules/cm² to about 10 joules/cm² of UV energy into said tape.
11. A UV energy curable tape comprising:
a support layer including a material which starts to emit optical light of a first type when said tape is becomes substantially fully cured; and
an adhesive material positioned on said support layer and having a UV energy curable oligomer and a UV energy initiator as part thereof.
12. The UV energy curable tape of claim 11, wherein said adhesive material comprises an acrylate oligomer.

14. The UV energy curable tape of claim 11, wherein said UV energy initiator comprises a photoinitiator.
16. The UV energy curable tape of claim 11, wherein said material which emits optical light comprises UV sensitive ink.
17. The UV energy curable tape of claim 16, wherein said material which emits optical light comprises from about .001 weight percent to about 20 weight percent of said tape.
18. The UV energy curable tape of claim 11, wherein said material which emits optical light comprises UV sensitive dye.
19. The UV energy curable tape of claim 11, wherein substantially fully cured comprises the absorption of about 5 millijoules/cm² to about 10 joules/cm² of UV energy into said tape.
30. The UV energy curable tape of Claim 1, wherein the light emitting material emits light of a second type, different from said first type, as the tape is being cured, and the type of light emitted by said light emitting material changes from said second type to said first type when the tape becomes substantially fully cured.

31. The UV energy curable tape of Claim 1, for use with a given substrate, and wherein the amount of energy needed to cause the light emitting material to emit the first type of light matches the amount of energy required to substantially fully cure the tape, thereby to facilitate completely removing the tape from the given substrate.

32. The UV energy curable tape of Claim 1, wherein:
the material which starts to emit optical light is a UV sensitive material;
and
the light emitting energy range of the light emitting material matches the amount of UV energy required to substantially fully cure the tape.

33. The UV energy curable tape of Claim 1, wherein
said material which emits optical light comprises about 0.001% by weight of the tape;
said material which emits optical light starts to emit optical light of the first type when said tape absorbs about 10 joules/cm² of UV energy.

34. A UV energy curable tape comprising:
a support layer;
an adhesive material positioned on said support layer, and including a UV energy curable oligomer, a UV energy initiator, and given a material for emitting light;

wherein a defined amount of UV energy is needed to substantially fully cure the tape; and

said same defined amount of UV energy causes the given material to begin to emit light of a given type, whereby said given material provides a visible indication that the tape is substantially fully cured.

35. A UV energy curable tape according to Claim 34, wherein:

said given material is a UV sensitive ink and comprises about 0.001% by weight of the tape; and

said given material starts to emit light of the given type when the tape absorbs about 10 joules/cm² of UV energy.